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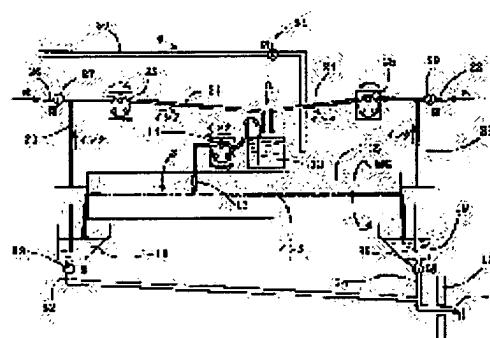
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(54) INK SUPPLY-RECOVERY APPARATUS IN PRINTING MACHINE

(57)Abstract:

PURPOSE: To reduce an ink loss during the replacement of ink in a flexographic press, to increase the recovery percentage of ink, and to facilitate a later cleaning process.

CONSTITUTION: An ink tank 13, a pump 14, and a nozzle part 15 are installed close to the upper side of an ink reservoir part 3 which is formed between an anilox roller 1 and an ink roller 2 to be able to move in the longitudinal direction of the ink reservoir part 3 through a transfer base. When ink is supplied, the pump 14 is actuated normally to supply ink in the ink tank 13 to the ink reservoir part 3. Besides, during the change of ink colors, the pump 14 is operated in a reverse way, and the nozzle part 15 is moved in the longitudinal direction of the ink reservoir part 3 with the ink tank 13 and the pump 14 to suck the residual ink to recover it into the ink tank 13. During cleaning, water, etc., are supplied to both rollers 1, 2, circulating pipelines 20, 21, etc.



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CLAIMS

[Claim(s)]

[Claim 1] Ink is supplied to the ink reservoir section formed in the valley between anilox roll and both the rolls of an ink roll. Make it overflow from the end section at least, and excessive ink is set to the printing machine of both [these] rolls which makes said ink reservoir section circulate through this through a circulation duct. While forming the ink tank which approaches the ink reservoir section during said both rolls, and holds said ink through which it circulates Supply and the recovery system of the ink in the printing machine characterized by establishing the pump means of supply / recovery combination which collects the ink of the ink reservoir section on said ink tank through the nozzle section while supplying ink to said ink reservoir section from the ink tank.

[Claim 2] The supply and the recovery system according to claim 1 which established a migration means to move the nozzle section to the shaft orientations of said both rolls at least among said ink tank, said pump means, and said nozzle section.

[Claim 3] The supply and the recovery system according to claim 1 carried in the movable carriage which said ink tank, said pump means, and said nozzle section move in accordance with the shaft orientations of said both rolls.

[Claim 4] While supply of ink is suspended by said ink reservoir section from said ink tank After the ink of the ink reservoir section was recovered by said pump means in said ink tank and the ink for said overflow has also been collected by said ink tank The first penetrant remover supply means which supplies a penetrant remover to said ink reservoir section, and washes the ink reservoir section, A penetrant remover is supplied to said circulation duct which circulates the ink for said overflow. Claim 1 equipped with the second penetrant remover supply means which washes the circulation duct, and a penetrant remover discharge means to discharge the used penetrant remover supplied by the these firsts and second penetrant remover supply means thru/or supply and a recovery system given in 3.

[Claim 5] The supply and the recovery system according to claim 1 to 4 with which a supplement supply means to supplement said ink tank with ink is established.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]

[Industrial Application] This invention is supplied circulating ink in a flexographic press, and mainly relates to supply and the recovery system of the ink which collects ink in the time of printing termination or an ink substitute etc.

[0002]

[Description of the Prior Art] As shown in drawing 1, while forming the ink reservoir section 3 in the valley during both the rolls of anilox roll 1 and an ink roll 2, forming the thin ink film in anilox roll 1 according to a scraping operation of an ink roll 2 in a flexographic press etc. and imprinting this to a printing cylinder 4, there are some which perform predetermined printing in the corrugated paper sheet 6 grade supplied between this printing cylinder 4 and press roll 5.

[0003] In order to prevent that it gets dry in a flexographic press here the relation top which mainly uses quick-drying ink, and before an imprint As shown in drawing 2, while supplying ink to both the rolls 1 and the ink reservoir section 3 between two, excessive ink is made to overflow from the both ends, these is collected in duct 7 grade on the ink tank 8, and, usually the ink reservoir section 3 is further circulated through the circulation duct 9. Here, in the time of printing termination, a color substitute of ink, etc., after collecting the ink in the ink reservoir section 3 on the ink tank 8, washing the ink reservoir section 3, a duct 7, and 9 grades is performed.

[0004]

[Problem(s) to be Solved by the Invention] However, since the duct 7 and 9 grades which circulate ink are long, there is much incross, and also the conventional printing machine takes considerable time amount collecting the ink of the ink reservoir section 3 on the ink tank 8 by free fall. Moreover, although the ink of the ink reservoir section 3 is collected by free fall, a certain amount of ink also has the problem which requires time amount for next washing in order to remain.

[0005] In addition, although there are some which shortened the circulation path by approaching and forming the ink tank 8 above both the rolls 1 and 2, it is difficult to collect the ink which still remains in the ink reservoir section 3 for a short time, and it cannot be say to be sufficient thing from the point of easy-izing of washing, either.

[0006] The technical problem of this invention is to offer supply and the recovery system of the ink which collects ink quickly and also makes washing easy while it shortens the circulation path of ink and lessens incross.

[0007]

[Means for Solving the Problem and its Function and Effect] forming the ink tank which this invention approaches the ink reservoir section between ** anilox roll and an ink roll, and holds the ink through which it circulates, and ** -- it is characterized by having been attached to the ink tank and forming the pump means of combination in supply and recovery of ink. While the pump means supplies ink to the ink reservoir section from an ink tank, it collects the ink of the ink reservoir section on said ink tank through the nozzle section. For example, ink is recoverable [on an ink tank] by the suction effect through the nozzle section by supplying ink to the ink reservoir section and reversing it by rotating the pump means normally.

[0008] According to such equipment, when an ink tank is approached and located the upper part of the ink reservoir section, the slanting upper part, horizontally, etc., a circulation duct becomes short and the incrosses at the time of an ink substitute etc. decrease by it. Moreover, the ink in which a pump means to be attached to the ink tank remains in the ink reservoir section before washing by playing two roles of collecting ink from supplying ink and the ink reservoir section can be decreased as much as possible. Consequently, next washing becomes easy and the time

amount is also shortened.

[0009] Here, a migration means to move the nozzle section to the shaft orientations of both the above-mentioned rolls at least among the above-mentioned ink tank, a pump means, and the nozzle section can be established. For example, all the these 3 persons are carried in a movable carriage, and it constitutes so that this movable carriage may be moved in accordance with the shaft orientations of both rolls. Thereby, in case suction etc. recovers the ink of for example, the ink reservoir section, it becomes a short time and an owner effect more recoverable [ink] by making recovery perform, moving the nozzle section to the longitudinal direction of the ink reservoir section through a movable carriage.

[0010] Since it is washing after recovery of ink, the following configurations can be taken. It forms a penetrant remover discharge means in first penetrant remover supply means to function in the condition after supply of ink was suspended by the ink reservoir section, the completion condition, i.e., the ink tank, of recovery of ink, and the ink of the ink reservoir section was recovered by the pump means in the ink tank and overflowed ink was also collected by the ink tank, the second penetrant remover supply means, and a pan. The first penetrant remover supply means supplies a penetrant remover to the ink reservoir section, and washes the ink reservoir section. The second penetrant remover supply means supplies a penetrant remover to the above-mentioned circulation duct which circulates the ink for the above-mentioned overflow, and washes the circulation duct. A penetrant remover discharge means plays the role which discharges the used penetrant remover supplied by the these firsts and second penetrant remover supply means.

[0011] In addition, in the condition that ink is supplied to the ink reservoir section from an ink tank, since the amount of the ink in that tank decreases gradually, it can also establish a supplement supply means to supplement this tank with ink.

[0012]

[Example] Hereafter, the example of this invention is explained based on a drawing. Drawing 3 shows the whole ink supply and recovery system of the flexographic press which is the one example simple. Above-mentioned anilox roll 1 and an above-mentioned ink roll 2 are prepared in the frame 12 of equipment, and the ink reservoir section 3 is formed of the valley of both rolls. It approaches above the ink reservoir section 3 formed with both [these] the rolls 1 and 2, the ink tank 13 is formed, and the tubing pump (only henceforth a pump) 14 is formed as a pump means to be attached to this tank 13. A pump 14 attracts ink from a tank 13, and supplies this to the ink reservoir section 3 from the nozzle section 15. Moreover, when a pump 14 is reversed, the ink which is in the ink reservoir section 3 from the nozzle section 13 can be attracted, and these can be collected on the ink tank 13.

[0013] It approaches down the both ends (both ends of the ink reservoir section 3) of both the rolls 1 and 2, the ink receptacles 18 and 19 are formed, and the excessive ink overflowed from the both ends of the ink reservoir section 3 flows and falls to these ink receptacles 18 and 19.

[0014] The ink once held in the ink receptacle 18 is returned to the ink tank 13 through the circulation ducts 20 and 21, and the tubing pump (only henceforth a pump) 22 is formed in the way of these circulation ducts 20 and 21 as a pump means for ink circulation. The ink which was once able to receive with the ink receptacle 19 of another side is similarly returned to the ink tank 13 through the circulation ducts 23 and 24, and the tubing pump (only henceforth a pump) 25 is formed in the way of these circulation ducts 23 and 24 as a pump means for ink circulation.

[0015] The penetrant remover supply line 26 is connected to the circulation ducts 20 and 21 through the closing motion-type bulb 27, and the same penetrant remover supply line 28 is

connected to them through the closing motion-type bulb 29 also in the circulation ducts 23 and 24 of another side. Moreover, separately from these, it is prepared so that the penetrant remover supply line 30 may carry out opening above both the rolls 1 and the ink reservoir section 3 between two, and the closing motion-type bulb 31 is formed in the way. This duct 30 functions as first penetrant remover supply means, and plays the role which flushes the ink adhering to the ink reservoir section 3, and washes this. Moreover, the above-mentioned penetrant remover supply lines 26 and 28 function as second penetrant remover supply means, and play the role which flushes the ink which has adhered in the circulation ducts 20 and 21, the circulation duct 23, and 24, and washes these.

[0016] The penetrant remover exhaust pipe way 32 is connected through the closing motion-type bulb 33, the same penetrant remover exhaust pipe way 34 is connected also to the ink receptacle 19 of another side through the closing motion-type bulb 35, and these join the above-mentioned ink receptacle 18 in the discharge edge 36. Each exhaust pipe ways 32 and 34 collect the penetrant removers with which ink after being used for washing was mixed.

[0017] the ink tank 13 -- usually -- the longitudinal direction of the ink reservoir section 3 -- it is in central A location mostly. the case where the ink of the ink reservoir section 3 is collected although the ink tap hole which is the end of the above-mentioned circulation ducts 21 and 24 is exactly located above the ink tank 13 in this A location etc. -- setting -- the ink tank 13, a pump 14, and the nozzle section 15 -- the longitudinal direction of the ink reservoir section 3 -- in other words, it is movable to the shaft orientations of both the rolls 1 and 2.

[0018] Drawing 4 shows the device of this migration simple, approaches both the rolls 1 and 2 bottom, and a guide rail 42 is prolonged almost horizontally and it is supported with the above-mentioned frame 12. A movable carriage 40 is formed on this guide rail 42, and it can run now a guide-rail 42 top in two or more wheels 41. The nozzle section 15 which is not illustrated is carried in this movable carriage 40 in the ink tank 13, an above-mentioned pump 14, and this above-mentioned drawing.

[0019] After a chain 43 or a timing belt rolls a movable carriage 40, and moving by screw-thread type driving means, such as a credit conduction means or a **** shaft, for example, winding a chain 43 around wheels 44 and 45 almost, those both ends are fixed to a movable carriage 40. And when a wheel 44 drives by the motor 46, for example, a movable carriage 40 will move to the longitudinal direction of drawing 4 through a chain 43. The initial valve position (home position) of this movement magnitude and a movable carriage 40 etc. is computed by the migration length detection means of the rotary encoder 47 grade which detects the rotational frequency of a motor 46.

[0020] Drawing 5 shows an above-mentioned movable carriage 40 and its above-mentioned loading object in more detail, and the nozzle section 15 goes up and down it with the rise-and-fall means of air cylinder 50 grade through a nozzle holder 48. Those rise and fall were permitted with the flexible tube 51, and this tube 51 is connected with the ink tank 13 through the pump 14 and the tube 52.

[0021] If the nozzle section 15 descends through an air cylinder 50, the nozzle tip 54 will advance to the deepest part of the ink reservoir section 3. In order to enable this penetration, the point is thin as the nozzle tip 54 is shown in drawing 6 (a). In addition, not a double-sided taper but the nozzle tip 55 where only one side was made into the shape of a taper as shown in (b) is sufficient.

[0022] The above-mentioned tubing pump 14 (the same is said of the other pumps 22 and 25) will do a recovery operation of ink so, if supply or recovery of ink is performed, body of

revolution 56 is normally rotated by repeating and carrying out elastic deformation of the tube 51 with two or more flexible projected parts 57 prepared in body of revolution 56, it will supply and ink will make it reverse as shown in drawing 7.

[0023] Next, flow is explained for each process of the ink supply in the above examples, ink recovery, and washing later on with time.

[0024] First, as shown in drawing 3 at the time of ink supply, the ink tank 13 is in the condition of the shaft orientations of both the rolls 1 and 2 of having been positioned by the above-mentioned movable carriage 40 in central A location, mostly. Under the present circumstances, the ducts 26, 28, and 30 which supply penetrant removers, such as water, do not carry out supply of a penetrant remover by closing each bulb 27, 29, and 31. Moreover, each bulbs 33 and 35 of the lower part of the ink receptacles 18 and 19 are also closed, respectively.

[0025] The ink of the ink tank 13 is supplied to the ink reservoir section 3 from the nozzle section 15 with a pump 14. The ink is overflowed from the both ends of the longitudinal direction of the ink reservoir section 3, and flows and falls to the ink receptacles 18 and 19. Furthermore, through the circulation ducts 20 and 21 and the circulation ducts 23 and 24, it is circulated by actuation of pumps 22 and 25 so that the ink of the ink receptacles 18 and 19 may return to the ink tank 13. Presswork will be continued in this condition and the ink tank 13, a pump 14, and nozzle section 15 grade continue being located in A location of drawing by the movable carriage 40 shown in drawing 5 etc. Moreover, the nozzle section 15 is maintained at a rise location by the air cylinder 50, and the nozzle tip can be prevented from touching it on the ink top face.

[0026] When need, such as a color substitute of ink, arises when ending presswork or, recovery of ink is performed as first shown in drawing 8. That is, rotation of both the rolls 1 and 2 stops, and the pumps 22 and 25 for circulation are also once stopped by the actuation. When the movable carriage 40 shown in drawing 4 and drawing 5 moves through a chain 43 by actuation of a motor 46 in this condition, a tank 13, a pump 14, and the nozzle section 15 separate from A location of the beginning, and move to the longitudinal direction of the ink reservoir section 3 toward the edge which is one side first. Under the present circumstances, the nozzle section 15 descends by the air cylinder 50 of drawing 5, and it is made for that nozzle tip 54 to be entered in the inner part of the ink reservoir section 3. A pump 14 is reversed in this condition, the ink which exists in the ink reservoir section 3 from the nozzle section 15 is attracted, and these is collected on the ink tank 13. This recovery process can be performed moving a tank 13, a pump 14, and the nozzle section 15 in one.

[0027] After recovery of the ink from the ink reservoir section 3 by suction of such a pump 14 finishes, as shown in drawing 9, a tank 13, an above-mentioned pump 14, and the above-mentioned nozzle section 15 return to the original location at the time of ink supply by the above-mentioned movable carriage 40 as a following process. That is, the ink tank 13 returns to A location, circulating pumps 22 and 25 operate in this condition, and the ink which remains to each ink receptacles 18 and 19 is sucked up on the ink tank 13 through the circulation ducts 20 and 21 and the circulation ducts 23 and 24.

[0028] Now, it means ending and then recovery of ink shifts to the washing process by water etc. That is, as shown in drawing 10 R>0, it is rotated for washing of both the rollers 1 and 2. And when a bulb 31 opens, penetrant removers, such as water, flow down on both the rollers 1 and 2 through the penetrant remover supply line 30. The ink which has adhered to the front face of both the rollers 1 and 2 by this penetrant remover is flushed, and the penetrant remover containing that ink flows down from the both ends of both the rollers 1 and 2 to the ink

receptacles 18 and 19, respectively.

[0029] On the other hand, when bulbs 27 and 29 open, penetrant removers, such as water, are supplied from the penetrant remover supply lines 26 and 28, respectively. It branches to two, one of these circulates the circulation ducts 21 and 24 by actuation of each pumps 22 and 25, and washes those interior, and the water containing ink flows down it on both the rolls 1 and 2. Moreover, the flow of another side which branched above flows down the circulation ducts 20 and 23 below, and washes those interior, and the water with which ink was mixed flows into the ink receptacles 18 and 19.

[0030] By opening the bulbs 33 and 35 attached to them wide, the used penetrant remover with which ink was mixed flows down through the penetrant remover exhaust pipe ways 32 and 34, and is discharged from the discharge edge 36.

[0031] After such washing is completed, in the next operation of a printing machine, in a color substitute of waiting or ink etc., the ink tank 13 which held the new ink will be installed in the movable carriage 40 of drawing 5, the new ink will be supplied to both the rolls 1 and the ink reservoir section 3 between two, and the same ink supply and circulation as the above-mentioned will be continued. By carrying the ink tank 13 in a movable carriage 40 free [attachment and detachment], it can respond to an ink substitute of a color substitute etc. promptly. In addition, the last ink which remains in the nozzle section 15 in drawing 5, a tube 51, and 52 grades will be washed suitably.

TECHNICAL FIELD

[Industrial Application] This invention is supplied circulating ink in a flexographic press, and mainly relates to supply and the recovery system of the ink which collects ink in the time of printing termination or an ink substitute etc.

PRIOR ART

[Description of the Prior Art] As shown in drawing 1, while forming the ink reservoir section 3 in the valley during both the rolls of anilox roll 1 and an ink roll 2, forming the thin ink film in anilox roll 1 according to a scraping operation of an ink roll 2 in a flexographic press etc. and imprinting this to a printing cylinder 4, there are some which perform predetermined printing in the corrugated paper sheet 6 grade supplied between this printing cylinder 4 and press roll 5.

[0003] In order to prevent that it gets dry in a flexographic press here the relation top which mainly uses quick-drying ink, and before an imprint As shown in drawing 2, while supplying ink to both the rolls 1 and the ink reservoir section 3 between two, excessive ink is made to overflow from the both ends, these is collected in duct 7 grade on the ink tank 8, and, usually the ink reservoir section 3 is further circulated through the circulation duct 9. Here, in the time of printing termination, a color substitute of ink, etc., after collecting the ink in the ink reservoir section 3 on the ink tank 8, washing the ink reservoir section 3, a duct 7, and 9 grades is performed.

EFFECT OF THE INVENTION

[Means for Solving the Problem and its Function and Effect] forming the ink tank which this invention approaches the ink reservoir section between ** anilox roll and an ink roll, and holds the ink through which it circulates, and ** -- it is characterized by having been attached to the ink tank and forming the pump means of combination in supply and recovery of ink. While the pump means supplies ink to the ink reservoir section from an ink tank, it collects the ink of the ink reservoir section on said ink tank through the nozzle section. For example, ink is recoverable [on an ink tank] by the suction effect through the nozzle section by supplying ink to the ink reservoir section and reversing it by rotating the pump means normally.

[0008] According to such equipment, when an ink tank is approached and located the upper part of the ink reservoir section, the slanting upper part, horizontally, etc., a circulation duct becomes short and the incrosses at the time of an ink substitute etc. decrease by it. Moreover, the ink in which a pump means to be attached to the ink tank remains in the ink reservoir section before washing by playing two roles of collecting ink from supplying ink and the ink reservoir section can be decreased as much as possible. Consequently, next washing becomes easy and the time amount is also shortened.

[0009] Here, a migration means to move the nozzle section to the shaft orientations of both the above-mentioned rolls at least among the above-mentioned ink tank, a pump means, and the nozzle section can be established. For example, all the these 3 persons are carried in a movable carriage, and it constitutes so that this movable carriage may be moved in accordance with the shaft orientations of both rolls. Thereby, in case suction etc. recovers the ink of for example, the ink reservoir section, it becomes a short time and an owner effect more recoverable [ink] by making recovery perform, moving the nozzle section to the longitudinal direction of the ink reservoir section through a movable carriage.

[0010] Since it is washing after recovery of ink, the following configurations can be taken. It forms a penetrant remover discharge means in first penetrant remover supply means to function in the condition after supply of ink was suspended by the ink reservoir section, the completion condition, i.e., the ink tank, of recovery of ink, and the ink of the ink reservoir section was recovered by the pump means in the ink tank and overflowed ink was also collected by the ink tank, the second penetrant remover supply means, and a pan. The first penetrant remover supply means supplies a penetrant remover to the ink reservoir section, and washes the ink reservoir section. The second penetrant remover supply means supplies a penetrant remover to the above-mentioned circulation duct which circulates the ink for the above-mentioned overflow, and washes the circulation duct. A penetrant remover discharge means plays the role which discharges the used penetrant remover supplied by the these firsts and second penetrant remover supply means.

[0011] In addition, in the condition that ink is supplied to the ink reservoir section from an ink tank, since the amount of the ink in that tank decreases gradually, it can also establish a supplement supply means to supplement this tank with ink.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, since the duct 7 and 9 grades which circulate ink are long, there is much incross, and also the conventional printing machine takes

considerable time amount collecting the ink of the ink reservoir section 3 on the ink tank 8 by free fall. Moreover, although the ink of the ink reservoir section 3 is collected by free fall, a certain amount of ink also has the problem which requires time amount for next washing in order to remain.

[0005] In addition, although there are some which shortened the circulation path by approaching and forming the ink tank 8 above both the rolls 1 and 2, it is difficult to collect the ink which still remains in the ink reservoir section 3 for a short time, and it cannot be said to be sufficient thing from the point of easyizing of washing, either.

[0006] The technical problem of this invention is to offer supply and the recovery system of the ink which collects ink quickly and also makes washing easy while it shortens the circulation path of ink and lessens incross.

EXAMPLE

[Example] Hereafter, the example of this invention is explained based on a drawing. Drawing 3 shows the whole ink supply and recovery system of the flexographic press which is the one example simple. Above-mentioned anilox roll 1 and an above-mentioned ink roll 2 are prepared in the frame 12 of equipment, and the ink reservoir section 3 is formed of the valley of both rolls. It approaches above the ink reservoir section 3 formed with both [these] the rolls 1 and 2, the ink tank 13 is formed, and the tubing pump (only henceforth a pump) 14 is formed as a pump means to be attached to this tank 13. A pump 14 attracts ink from a tank 13, and supplies this to the ink reservoir section 3 from the nozzle section 15. Moreover, when a pump 14 is reversed, the ink which is in the ink reservoir section 3 from the nozzle section 13 can be attracted, and these can be collected on the ink tank 13.

[0013] It approaches down the both ends (both ends of the ink reservoir section 3) of both the rolls 1 and 2, the ink receptacles 18 and 19 are formed, and the excessive ink overflowed from the both ends of the ink reservoir section 3 flows and falls to these ink receptacles 18 and 19.

[0014] The ink once held in the ink receptacle 18 is returned to the ink tank 13 through the circulation ducts 20 and 21, and the tubing pump (only henceforth a pump) 22 is formed in the way of these circulation ducts 20 and 21 as a pump means for ink circulation. The ink which was once able to receive with the ink receptacle 19 of another side is similarly returned to the ink tank 13 through the circulation ducts 23 and 24, and the tubing pump (only henceforth a pump) 25 is formed in the way of these circulation ducts 23 and 24 as a pump means for ink circulation.

[0015] The penetrant remover supply line 26 is connected to the circulation ducts 20 and 21 through the closing motion-type bulb 27, and the same penetrant remover supply line 28 is connected to them through the closing motion-type bulb 29 also in the circulation ducts 23 and 24 of another side. Moreover, separately from these, it is prepared so that the penetrant remover supply line 30 may carry out opening above both the rolls 1 and the ink reservoir section 3 between two, and the closing motion-type bulb 31 is formed in the way. This duct 30 functions as first penetrant remover supply means, and plays the role which flushes the ink adhering to the ink reservoir section 3, and washes this. Moreover, the above-mentioned penetrant remover supply lines 26 and 28 function as second penetrant remover supply means, and play the role which flushes the ink which has adhered in the circulation ducts 20 and 21, the circulation duct 23, and 24, and washes these.

[0016] The penetrant remover exhaust pipe way 32 is connected through the closing motion-type

bulb 33, the same penetrant remover exhaust pipe way 34 is connected also to the ink receptacle 19 of another side through the closing motion-type bulb 35, and these join the above-mentioned ink receptacle 18 in the discharge edge 36. Each exhaust pipe ways 32 and 34 collect the penetrant removers with which ink after being used for washing was mixed.

[0017] the ink tank 13 -- usually -- the longitudinal direction of the ink reservoir section 3 -- it is in central A location mostly. the case where the ink of the ink reservoir section 3 is collected although the ink tap hole which is the end of the above-mentioned circulation ducts 21 and 24 is exactly located above the ink tank 13 in this A location etc. -- setting -- the ink tank 13, a pump 14, and the nozzle section 15 -- the longitudinal direction of the ink reservoir section 3 -- in other words, it is movable to the shaft orientations of both the rolls 1 and 2.

[0018] Drawing 4 shows the device of this migration simple, approaches both the rolls 1 and 2 bottom, and a guide rail 42 is prolonged almost horizontally and it is supported with the above-mentioned frame 12. A movable carriage 40 is formed on this guide rail 42, and it can run now a guide-rail 42 top in two or more wheels 41. The nozzle section 15 which is not illustrated is carried in this movable carriage 40 in the ink tank 13, an above-mentioned pump 14, and this above-mentioned drawing.

[0019] After a chain 43 or a timing belt rolls a movable carriage 40, and moving by screw-thread type driving means, such as a credit conduction means or a **** shaft, for example, winding a chain 43 around wheels 44 and 45 almost, those both ends are fixed to a movable carriage 40. And when a wheel 44 drives by the motor 46, for example, a movable carriage 40 will move to the longitudinal direction of drawing 4 through a chain 43. The initial valve position (home position) of this movement magnitude and a movable carriage 40 etc. is computed by the migration length detection means of the rotary encoder 47 grade which detects the rotational frequency of a motor 46.

[0020] Drawing 5 shows an above-mentioned movable carriage 40 and its above-mentioned loading object in more detail, and the nozzle section 15 goes up and down it with the rise-and-fall means of air cylinder 50 grade through a nozzle holder 48. Those rise and fall were permitted with the flexible tube 51, and this tube 51 is connected with the ink tank 13 through the pump 14 and the tube 52.

[0021] If the nozzle section 15 descends through an air cylinder 50, the nozzle tip 54 will advance to the deepest part of the ink reservoir section 3. In order to enable this penetration, the point is thin as the nozzle tip 54 is shown in drawing 6 (a). In addition, not a double-sided taper but the nozzle tip 55 where only one side was made into the shape of a taper as shown in (b) is sufficient.

[0022] The above-mentioned tubing pump 14 (the same is said of the other pumps 22 and 25) will do a recovery operation of ink so, if supply or recovery of ink is performed, body of revolution 56 is normally rotated by repeating and carrying out elastic deformation of the tube 51 with two or more flexible projected parts 57 prepared in body of revolution 56, it will supply and ink will make it reverse as shown in drawing 7.

[0023] Next, flow is explained for each process of the ink supply in the above examples, ink recovery, and washing later on with time.

[0024] First, as shown in drawing 3 at the time of ink supply, the ink tank 13 is in the condition of the shaft orientations of both the rolls 1 and 2 of having been positioned by the above-mentioned movable carriage 40 in central A location, mostly. Under the present circumstances, the ducts 26, 28, and 30 which supply penetrant removers, such as water, do not carry out supply of a penetrant remover by closing each bulb 27, 29, and 31. Moreover, each bulbs 33 and 35 of

the lower part of the ink receptacles 18 and 19 are also closed, respectively.

[0025] The ink of the ink tank 13 is supplied to the ink reservoir section 3 from the nozzle section 15 with a pump 14. The ink is overflowed from the both ends of the longitudinal direction of the ink reservoir section 3, and flows and falls to the ink receptacles 18 and 19. Furthermore, through the circulation ducts 20 and 21 and the circulation ducts 23 and 24, it is circulated by actuation of pumps 22 and 25 so that the ink of the ink receptacles 18 and 19 may return to the ink tank 13. Presswork will be continued in this condition and the ink tank 13, a pump 14, and nozzle section 15 grade continue being located in A location of drawing by the movable carriage 40 shown in drawing 5 etc. Moreover, the nozzle section 15 is maintained at a rise location by the air cylinder 50, and the nozzle tip can be prevented from touching it on the ink top face.

[0026] When need, such as a color substitute of ink, arises when ending presswork or, recovery of ink is performed as first shown in drawing 8. That is, rotation of both the rolls 1 and 2 stops, and the pumps 22 and 25 for circulation are also once stopped by the actuation. When the movable carriage 40 shown in drawing 4 and drawing 5 moves through a chain 43 by actuation of a motor 46 in this condition, a tank 13, a pump 14, and the nozzle section 15 separate from A location of the beginning, and move to the longitudinal direction of the ink reservoir section 3 toward the edge which is one side first. Under the present circumstances, the nozzle section 15 descends by the air cylinder 50 of drawing 5, and it is made for that nozzle tip 54 to be entered in the inner part of the ink reservoir section 3. A pump 14 is reversed in this condition, the ink which exists in the ink reservoir section 3 from the nozzle section 15 is attracted, and these is collected on the ink tank 13. This recovery process can be performed moving a tank 13, a pump 14, and the nozzle section 15 in one.

[0027] After recovery of the ink from the ink reservoir section 3 by suction of such a pump 14 finishes, as shown in drawing 9, a tank 13, an above-mentioned pump 14, and the above-mentioned nozzle section 15 return to the original location at the time of ink supply by the above-mentioned movable carriage 40 as a following process. That is, the ink tank 13 returns to A location, circulating pumps 22 and 25 operate in this condition, and the ink which remains to each ink receptacles 18 and 19 is sucked up on the ink tank 13 through the circulation ducts 20 and 21 and the circulation ducts 23 and 24.

[0028] Now, it means ending and then recovery of ink shifts to the washing process by water etc. That is, as shown in drawing 10 $R > 0$, it is rotated for washing of both the rollers 1 and 2. And when a bulb 31 opens, penetrant removers, such as water, flow down on both the rollers 1 and 2 through the penetrant remover supply line 30. The ink which has adhered to the front face of both the rollers 1 and 2 by this penetrant remover is flushed, and the penetrant remover containing that ink flows down from the both ends of both the rollers 1 and 2 to the ink receptacles 18 and 19, respectively.

[0029] On the other hand, when bulbs 27 and 29 open, penetrant removers, such as water, are supplied from the penetrant remover supply lines 26 and 28, respectively. It branches to two, one of these circulates the circulation ducts 21 and 24 by actuation of each pumps 22 and 25, and washes those interior, and the water containing ink flows down it on both the rolls 1 and 2. Moreover, the flow of another side which branched above flows down the circulation ducts 20 and 23 below, and washes those interior, and the water with which ink was mixed flows into the ink receptacles 18 and 19.

[0030] By opening the bulbs 33 and 35 attached to them wide, the used penetrant remover with which ink was mixed flows down through the penetrant remover exhaust pipe ways 32 and 34,

and is discharged from the discharge edge 36.

[0031] After such washing is completed, in the next operation of a printing machine, in a color substitute of waiting or ink etc., the ink tank 13 which held the new ink will be installed in the movable carriage 40 of drawing 5, the new ink will be supplied to both the rolls 1 and the ink reservoir section 3 between two, and the same ink supply and circulation as the above-mentioned will be continued. By carrying the ink tank 13 in a movable carriage 40 free [attachment and detachment], it can respond to an ink substitute of a color substitute etc. promptly. In addition, the last ink which remains in the nozzle section 15 in drawing 5, a tube 51, and 52 grades will be washed suitably.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] Drawing showing notionally an example of the printing machine with which this invention is applied.

[Drawing 2] Drawing mainly showing circulation of the ink in a flexographic press notionally.

[Drawing 3] It is the approximate account Fig. of the whole supply and recovery system of the ink which is one example of this invention, and is a process explanatory view at the time of supply.

[Drawing 4] The front view of migration devices, such as an ink tank.

[Drawing 5] The front view expanding and showing the movable carriage and its loading object of drawing 4.

[Drawing 6] Drawing showing the example of the tip configuration of the nozzle section.

[Drawing 7] The actuation explanatory view of a tubing pump.

[Drawing 8] The process explanatory view of the first half at the time of ink recovery.

[Drawing 9] The process explanatory view of the second half at the time of ink recovery.

[Drawing 10] The process explanatory view at the time of washing by water etc.

[Description of Notations]

1 Anilox Roll

2 Ink Roll

3 Ink Reservoir Section

13 Ink Tank

14 Tubing Pump (Pump Means)

15 Nozzle Section

20, 21, 23, 24 Circulation duct

26 28 Penetrant remover supply line (the second)

30 Penetrant Remover Supply Line (the First)

27, 29, 31, 33, 35 Bulb

32 34 Penetrant remover exhaust pipe way

40 Movable Carriage

42 Guide Rail

43 Chain

44 45 Wheel

46 Motor

50 Air Cylinder

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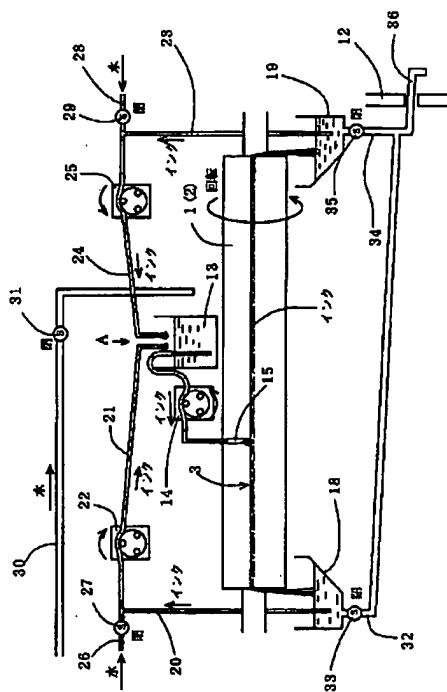
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(54)【発明の名称】 印刷機におけるインクの供給・回収装置

(57)【要約】

【目的】 フレキソ印刷機におけるインク替え時等のインクロスを少なくするとともに、インクの回収効率を高めて、後の洗浄工程を行い易くする。

【構成】 アニロックスロール1及びインクロール2間に形成されるインク溜め部3の上側に近接して、インクタンク13、ポンプ14及びノズル部15が設けられ、これらは移動台を介して、インク溜め部3の長手方向に移動できる。インク供給時にはポンプ14が正転作動してインクタンク13のインクをインク溜め部3に供給する。一方、インク色替え等の際は、ポンプ14が逆転作動し、ノズル部15がインクタンク13及びポンプ14とともにインク溜め部3の長手方向に移動しつつ、そこに残留するインクを吸引してインクタンク13に回収する。洗浄時には、水等が両ローラ1及び2並びに循環管路20、21等に供給される。



【特許請求の範囲】

【請求項1】 アニロックスロール及びインクロールの両ロール間の谷間に形成されるインク溜め部にインクを供給し、余剰のインクをそれら両ロールの少なくとも一端部からオーバーフローさせて、これを前記インク溜め部に循環管路を経て循環させる印刷機において、前記両ロール間のインク溜め部に近接して、前記循環されるインクを収容するインクタンクを設けるとともに、そのインクタンクから前記インク溜め部にインクを供給する一方、そのインク溜め部のインクをノズル部を介して前記インクタンクに回収する供給・回収兼用のポンプ手段を設けたことを特徴とする印刷機におけるインクの供給・回収装置。

【請求項2】 前記インクタンク、前記ポンプ手段及び前記ノズル部のうち、少なくともそのノズル部を前記両ロールの軸方向に移動させる移動手段を設けた請求項1記載の供給・回収装置。

【請求項3】 前記インクタンク、前記ポンプ手段及び前記ノズル部が、前記両ロールの軸方向に沿って移動する移動台に搭載されている請求項1記載の供給・回収装置。

【請求項4】 前記インクタンクから前記インク溜め部にインクの供給が停止されるとともに、そのインク溜め部のインクが前記ポンプ手段で前記インクタンク内に回収され、かつ前記オーバーフロー分のインクも前記インクタンクに回収された状態で、

前記インク溜め部に洗浄液を供給してそのインク溜め部を洗浄する第一の洗浄液供給手段と、

前記オーバーフロー分のインクを循環させる前記循環管路に洗浄液を供給して、その循環管路を洗浄する第二の洗浄液供給手段と、

それら第一及び第二の洗浄液供給手段により供給された使用済み洗浄液を排出する洗浄液排出手段と、

を備える請求項1ないし3に記載の供給・回収装置。

【請求項5】 前記インクタンクにインクを補充する補充供給手段が設けられている請求項1ないし4のいずれかに記載の供給・回収装置。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 この発明は、主にフレキソ印刷機において、インクを循環させながら供給し、印刷終了時又はインク替え時等においてインクを回収するインクの供給・回収装置に関する。

【0002】

【従来の技術】 図1に示すように、フレキソ印刷機において、アニロックスロール1とインクロール2との両ロール間の谷間にインク溜め部3を形成し、インクロール2の搔き取り作用によりアニロックスロール1に薄いインク膜を形成し、これを版胴4に転写するとともに、この版胴4とプレスロール5との間に供給される段ボ-

ルシート6等に所定の印刷を行うものがある。

【0003】 ここで、フレキソ印刷機等では、主に速乾性のインクを使用する関係上、転写前にそれが乾いてしまうことを防止するために、図2に示すように、両ロール1及び2間のインク溜め部3にインクを供給するとともに、その両端から余剰のインクをオーバーフローさせ、これをインクタンク8に管路7等で回収し、さらに循環管路9を経てインク溜め部3に循環させるのが普通である。ここで、印刷終了時やインクの色替え等の場合は、インク溜め部3にあるインクをインクタンク8に回収してから、インク溜め部3や管路7、9等を洗浄することが行われている。

【0004】

【発明が解決しようとする課題】 しかしながら、従来の印刷機では、インクを循環させる管路7、9等が長いためインクロスが多い他、インク溜め部3のインクを自由落下によりインクタンク8に回収するのに相当の時間を要する。また、インク溜め部3のインクは自由落下で回収されるが、ある程度のインクは残留するため、後の洗浄に時間がかかる問題もある。

【0005】 なお、インクタンク8を両ロール1及び2の上方に近接して設けることにより、循環経路を短くしたものもあるが、それでもインク溜め部3に残留するインクを短時間で回収することは難しく、洗浄の容易化の点からも充分なものとは言えない。

【0006】 本発明の課題は、インクの循環経路を短くしてインクロスを少なくするとともに、インクの回収を迅速に行い、かつ洗浄も容易にするインクの供給・回収装置を提供することにある。

【0007】

【課題を解決するための手段及び作用・効果】 本発明は、①アニロックスロール及びインクロール間のインク溜め部に近接して、循環されるインクを収容するインクタンクを設けること、②そのインクタンクに付属してインクの供給及び回収に兼用のポンプ手段を設けたことを特徴とする。そのポンプ手段は、インクタンクからインク溜め部にインクを供給する一方、そのインク溜め部のインクをノズル部を介して前記インクタンクに回収するものである。例えば、そのポンプ手段を正転させることによりインク溜め部にインクを供給し、逆転させることによりその吸引作用でノズル部を介してインクをインクタンクに回収することができる。

【0008】 このような装置によれば、インクタンクがインク溜め部の例ええば上方、斜め上方又は横等に近接して位置することにより循環管路が短くなり、それによってインク替え時等のインクロスが少なくなる。また、そのインクタンクに付属するポンプ手段が、インクを供給すること及びインク溜め部からインクを回収することとの二つの役割を果たすことにより、洗浄前にインク溜め部に残留するインクを可及的に減少させることができ

る。その結果、後の洗浄が容易となり、その時間も短縮される。

【0009】ここで、上記インクタンク、ポンプ手段及びノズル部のうち、少なくともそのノズル部を上記両ロールの軸方向に移動させる移動手段を設けることができる。例えば、それら三者の全てを移動台に搭載し、この移動台を両ロールの軸方向に沿って移動させるよう構成する。これにより、例えばインク溜め部のインクを吸引等により回収する際、移動台を介してそのノズル部をインク溜め部の長手方向に移動させつつ回収作業を行わせることにより、より短時間かつ有効にインクの回収が可能となる。

【0010】インクの回収の後の洗浄のために、例えば次のような構成をとり得る。それは、インクの回収の完了状態、つまりインクタンクからインク溜め部にインクの供給が停止され、そのインク溜め部のインクがポンプ手段でインクタンク内に回収され、かつオーバーフロー分のインクもインクタンクに回収された後の状態で機能する第一の洗浄液供給手段、第二の洗浄液供給手段、さらに洗浄液排出手段を設けたものである。第一の洗浄液供給手段は、インク溜め部に洗浄液を供給してそのインク溜め部を洗浄する。第二の洗浄液供給手段は、上記オーバーフロー分のインクを循環させる上記循環管路に洗浄液を供給して、その循環管路を洗浄する。洗浄液排出手段は、それら第一及び第二の洗浄液供給手段により供給された使用済み洗浄液を排出する役割を果たす。

【0011】なお、インクタンクからインク溜め部にインクが供給される状態では、そのタンク内のインクの量は徐々に減少していくため、このタンクにインクを補充する補充供給手段を設けることもできる。

【0012】

【実施例】以下、本発明の実施例を図面に基づいて説明する。図3は、その一実施例であるフレキソ印刷機のインク供給・回収装置の全体を簡略に示すものである。装置のフレーム12に前述のアニロックスロール1及びインクロール2が設けられ、両ロールの谷間にによりインク溜め部3が形成される。それら両ロール1及び2で形成されるインク溜め部3の上方に近接してインクタンク13が設けられ、このタンク13に付属するポンプ手段としてチューピングポンプ（以下、単にポンプという）14が設けられている。ポンプ14は、タンク13からインクを吸引して、これをノズル部15からインク溜め部3に供給する。また、ポンプ14が逆転することにより、ノズル部15からインク溜め部3にあるインクを吸引して、これをインクタンク13に回収することができる。

【0013】両ロール1及び2の両端（インク溜め部3の両端）の下方に近接してインク受け18及び19が設けられ、インク溜め部3の両端からオーバーフローした余剰のインクがこれらインク受け18、19に流れ落ち

るようになっている。

【0014】インク受け18に一旦収容されたインクは、循環管路20、21を経て、インクタンク13に戻されるようになっており、この循環管路20、21の途上にはインク循環用のポンプ手段としてチューピングポンプ（以下、単にポンプという）22が設けられている。他方のインク受け19で一旦受けられたインクも同様に、循環管路23、24を経てインクタンク13に戻されるようになっており、これら循環管路23、24の途上にはインク循環用のポンプ手段としてチューピングポンプ（以下、単にポンプという）25が設けられている。

【0015】循環管路20、21には、洗浄液供給管路26が開閉式のバルブ27を介して接続され、他方の循環管路23、24にも、同様の洗浄液供給管路28が開閉式のバルブ29を介して接続されている。また、これらとは別個に、洗浄液供給管路30が両ロール1及び2間のインク溜め部3の上方に開口するように設けられ、その途上には開閉式のバルブ31が設けられている。この管路30は、第一の洗浄液供給手段として機能するもので、インク溜め部3に付着しているインクを洗い流してここを洗浄する役割を果たす。また、前述の洗浄液供給管路26、28は、第二の洗浄液供給手段として機能するもので、循環管路20及び21、循環管路23及び24内に付着しているインクを洗い流してこれらを洗浄する役割を果たす。

【0016】前述のインク受け18には、洗浄液排出管路32が開閉式のバルブ33を介して接続され、他方のインク受け19にも同様の洗浄液排出管路34が開閉式のバルブ35を介して接続され、これらが排出端部36において合流している。各排出管路32、34は、洗浄に使用された後のインクが混ざった洗浄液を回収するものである。

【0017】インクタンク13は、通常は、インク溜め部3の長手方向のほぼ中央のA位置にある。このA位置では、前述の循環管路21及び24の末端であるインク流出口が、丁度インクタンク13の上方に位置するようになっているが、インク溜め部3のインクを回収する場合等においては、インクタンク13、ポンプ14及びノズル部15がインク溜め部3の長手方向、言い換えれば両ロール1及び2の軸方向に移動可能となっている。

【0018】図4は、この移動の機構を簡略に示すもので、両ロール1及び2の上側に近接してガイドレール42がほぼ水平方向に延びて、前述のフレーム12で支持されている。このガイドレール42上に移動台40が設けられ、複数の車輪41においてガイドレール42上を走行できるようになっている。この移動台40に前述のインクタンク13、ポンプ14及びこの図では図示しないノズル部15が搭載されている。

【0019】移動台40は、例えばチェーン43又はタ

イミングベルト等の巻き掛け伝導手段又はねじ軸等のねじ式駆動手段により移動するようになっており、例えばチェーン43がホイール44及び45に巻き掛けられた後、それらの両端が移動台40に固定される。そして、例えばホイール44がモータ46で駆動されることにより、チェーン43を介して移動台40が図4の左右方向に移動することとなる。この移動量及び移動台40の初期位置（ホームポジション）等は、モータ46の回転数を検出するロータリーエンコーダ47等の移動距離検出手段により算出される。

【0020】図5は、上述の移動台40及びその搭載物をより詳しく示すもので、ノズル部15が、ノズルホルダ48を介してエアシリンダ50等の昇降手段で昇降するようになっている。その昇降はフレキシブルなチューブ51により許容され、このチューブ51はポンプ14及びチューブ52を介してインクタンク13につながっている。

【0021】エアシリンダ50を介してノズル部15が下降すれば、そのノズル先端54はインク溜め部3の最深部まで進入する。この進入を可能するために、ノズル先端54は、図6(a)に示すように先が細くなっている。なお両面テープではなく、(b)に示すように片側のみテープ状とされたノズル先端55でもよい。

【0022】前述のチューピングポンプ14（その他のポンプ22、25についても同様）は、図7に示すように、回転体56に設けられた複数の突部57がフレキシブルなチューブ51を繰り返し弾性変形させることにより、インクの供給又は回収を行うもので、回転体56を正転されればインクの供給、逆転されればインクの回収作用を奏する。

【0023】次に、以上のような実施例におけるインク供給、インク回収及び洗浄の各工程を、経時的に流れを追って説明する。

【0024】まず、インク供給時には、図3に示すようにインクタンク13が、両ローラ1及び2の軸方向のほぼ中央のA位置に、前述の移動台40により位置決めされた状態にある。この際、水等の洗浄液を供給する管路26、28及び30は、それぞれのバルブ27、29及び31が閉じられていることにより、洗浄液の供給はしない。また、インク受け18及び19の下部の各バルブ33、35もそれぞれ閉じられている。

【0025】インクタンク13のインクは、ポンプ14によりノズル部15からインク溜め部3に供給される。そのインクは、インク溜め部3の長手方向の両端からオーバーフローしてインク受け18、19に流れ落ちる。さらにポンプ22及び25の作動により、循環管路20、21及び循環管路23、24を経て、インク受け18、19のインクがインクタンク13に戻るよう循環せられる。この状態で印刷工程が継続されることとなり、インクタンク13、ポンプ14及びノズル部15等

は、図5等に示す移動台40により図のA位置に位置し続ける。また、ノズル部15はエアシリンダ50により上昇位置に保たれ、そのノズル先端がインク上面に触れないようにすることができる。

【0026】印刷工程を終了する時、あるいはインクの色替え等の必要が生じた場合は、まず図8に示すように、インクの回収が行われる。すなわち、両ローラ1及び2の回転が停止し、かつ循環用のポンプ22及び25も一旦その作動が停止させられる。この状態で図4及び図5に示す移動台40が、モータ46の作動によりチェーン43を介して移動することによって、タンク13、ポンプ14及びノズル部15は当初のA位置から離れ、インク溜め部3の長手方向にまず一方の端に向かって移動する。この際、図5のエアシリンダ50によりノズル部15が下降し、そのノズル先端54がインク溜め部3の奥に入り込むようにされる。この状態でポンプ14が逆転し、ノズル部15からインク溜め部3に存在するインクを吸引してこれをインクタンク13に回収する。この回収工程は、タンク13、ポンプ14及びノズル部15を一体的に移動させつつ行うことができる。

【0027】このようなポンプ14の吸引によるインク溜め部3からのインクの回収が終わると、次の工程として、図9に示すように上述のタンク13、ポンプ14及びノズル部15は、前述の移動台40によりインク供給時の当初の位置に復帰する。つまり、インクタンク13がA位置に復帰し、この状態で循環ポンプ22及び25が作動して、各インク受け18及び19に残留するインクを、循環管路20、21及び循環管路23、24を経てインクタンク13に吸い上げる。

【0028】これで、インクの回収は終了したことになり、次に水等による洗浄工程に移行する。つまり、図10に示すように、両ローラ1及び2が洗浄のために回転させられる。そして、バルブ31が開くことにより、水等の洗浄液が洗浄液供給管路30を経て両ローラ1及び2上に流下する。この洗浄液により両ローラ1及び2の表面に付着しているインクが洗い流され、そのインクを含んだ洗浄液は両ローラ1及び2の両端からインク受け18及び19にそれぞれ流下する。

【0029】一方、バルブ27及び29が開くことにより、洗浄液供給管路26及び28からそれぞれ水等の洗浄液が供給される。それは二つに分岐し、その一方は各ポンプ22及び25の作動により循環管路21及び24を流通してそれらの内部を洗浄し、インクを含む水が両ローラ1及び2上に流下する。また、上記で分岐した他方の流れは、循環管路20及び23を下方へ流下してそれらの内部を洗浄し、インクの混じった水がインク受け18及び19に流れ込む。

【0030】それらに付属するバルブ33及び35が開放されることにより、インクの混ざった使用済みの洗浄液は、洗浄液排出管路32及び34を経て流下し、排出

端部 3 6 から排出される。

【0031】このような洗浄が終了した後は、印刷機の次の稼働を待ち、あるいはインクの色替え等の場合は、その新たなインクを収容したインクタンク 13 が図5の移動台 40 に設置され、その新たなインクが両ロール 1 及び 2 間のインク溜め部 3 に供給されて、前述と同様のインク供給・循環が継続されることとなる。インクタンク 13 を移動台 40 に着脱自在に搭載することにより、色替え等のインク替えに迅速に対応することができる。なお、図5におけるノズル部 15、チューブ 51 及び 52 等に残留する前回のインクは適宜洗浄されることとなる。

【図面の簡単な説明】

【図1】本発明が適用される印刷機の一例を概念的に示す図。

【図2】主にフレキソ印刷機におけるインクの循環を概念的に示す図。

【図3】本発明の一実施例であるインクの供給・回収装置の全体の概略説明図であり、かつ供給時の工程説明図。

【図4】インクタンク等の移動機構の正面図。

【図5】図4の移動台及びその搭載物を拡大して示す正面図。

【図6】ノズル部の先端形状の例を示す図。

【図7】チューピングポンプの作動説明図。

【図8】インク回収時の前半の工程説明図。

【図9】インク回収時の後半の工程説明図。

【図10】水等による洗浄時の工程説明図。

【符号の説明】

1 アニロックスロール

2 インクロール

3 インク溜め部

13 インクタンク

14 チューピングポンプ（ポンプ手段）

15 ノズル部

20、21、23、24 循環管路

26、28 洗浄液供給管路（第二の）

30 洗浄液供給管路（第一の）

27、29、31、33、35 バルブ

32、34 洗浄液排出管路

40 移動台

42 ガイドレール

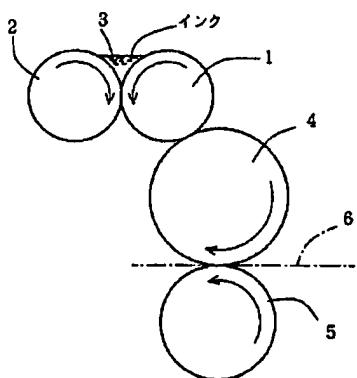
43 チェーン

44、45 ホイール

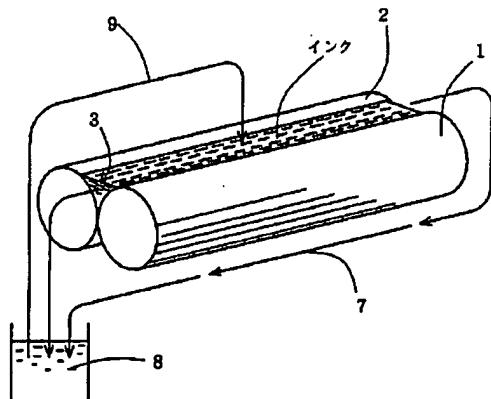
46 モータ

50 エアシリンダ

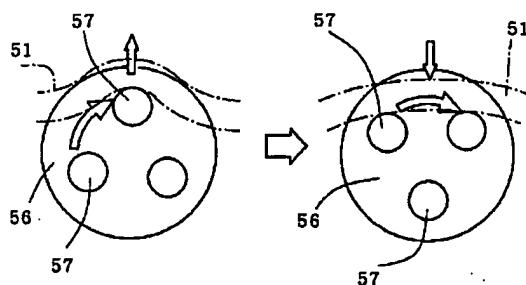
【図1】



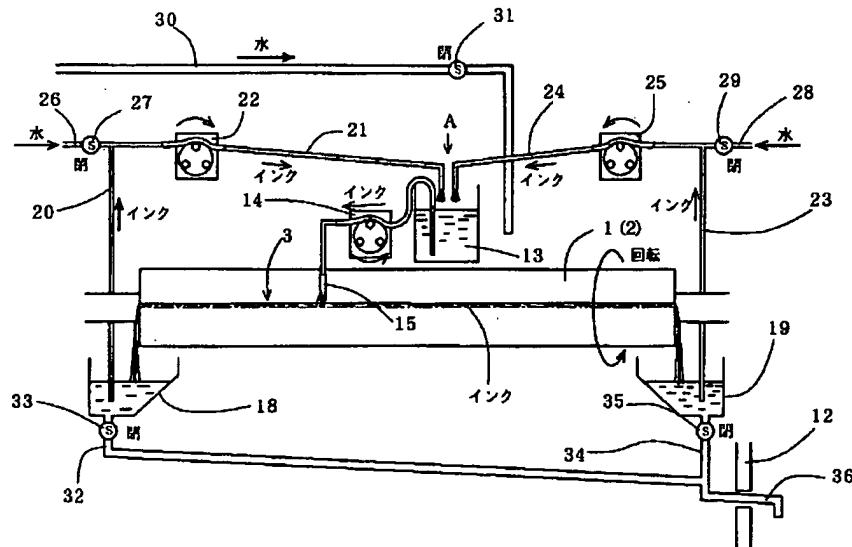
【図2】



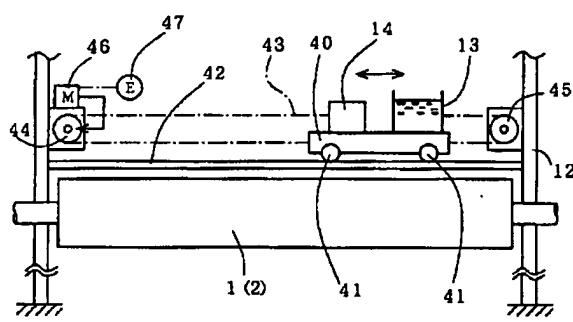
【図7】



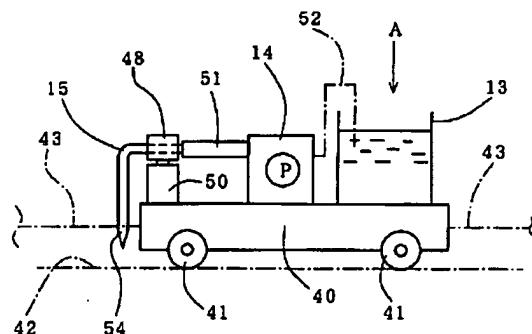
【図3】



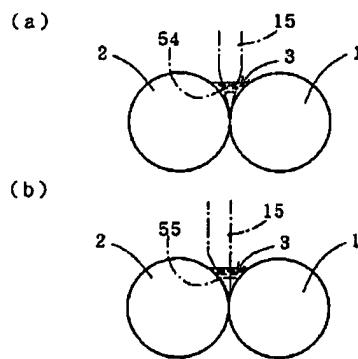
【図4】



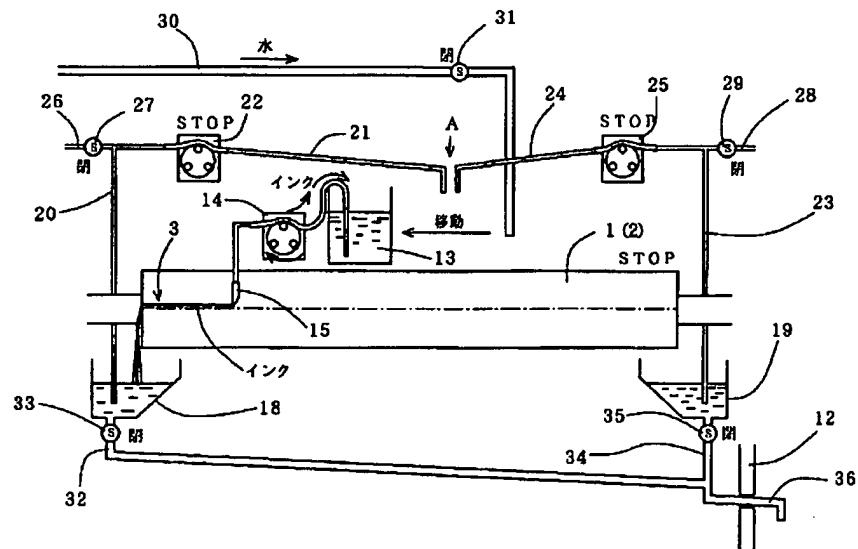
【図5】



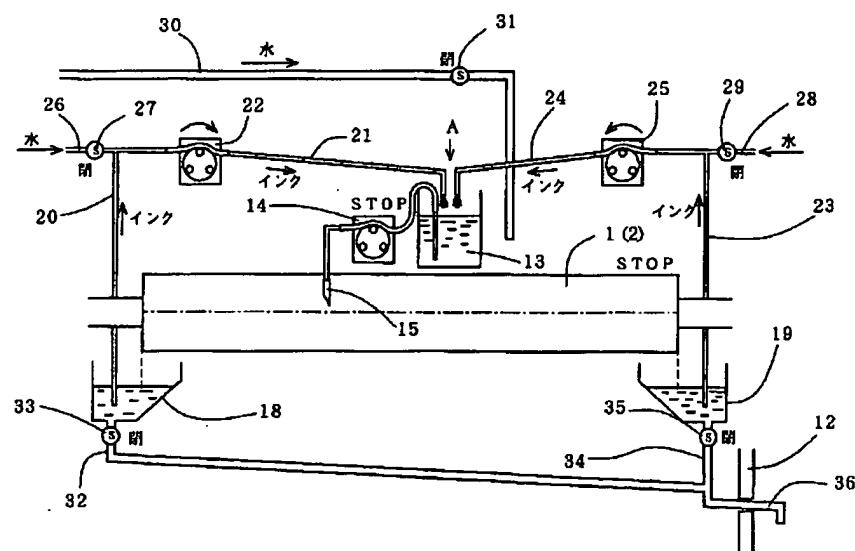
【図6】



【図8】



【図9】



【図10】

